

## REMARKS

The Applicant has received and reviewed the Final Action mailed by the Office on 18 May 2005 (hereinafter, the "Office Action"), and respectfully submits this paper in connection with a Request for Continued Examination (RCE) filed in the subject application. The Applicant respectfully requests reconsideration and withdrawal of the rejections lodged against the claims pending in the subject application.

Claims 1-18 and 20-86 are pending, of which claims 1-2, 4, 6, 8, 10-11, 13-14, 18, 27, 39, 42, 55, 73, and 81 have been amended. Claim 19 has been cancelled.

### 35 U.S.C. §102 Claim Rejections

Claims 1-14, 55-67, and 72-80 are rejected under 35 U.S.C. §102(a) as being anticipated by a document entitled "Windows 2000 Active Directory" by Lowe-Norris (hereinafter, "Norris") (*Office Action* p.2). Applicant respectfully traverses these rejections.

Turning to **independent claim 1**, the Applicant has revised claim 1 to clarify further features of the network system. The revisions to claim 1 are believed fully supported under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, at least by Figures 4-6 and related discussion appearing from page 10, line 4 to page 13, line 14 of the Applicant's specification.

For convenience, claim 1 is reproduced here, with the above revisions shown in redline:

1. (currently amended) A network system, comprising:

a first computer configured to maintain an object having ~~an~~ a multi-valued attribute ~~comprised of that~~ includes a value that links to a plurality of individual linked values, ~~each the~~ linked values having associated therewith respective conflict-resolution data, and wherein the first computer is adapted to update the conflict-resolution data associated with at least one linked value in response to at least a first modification made the linked value;

at least a second computer configured to replicate the object to generate a replica object, ~~and to maintain a replica of the value as a link to a plurality of replica linked values associated with the replica object, the replica linked values having associated therewith respective further conflict-resolution data, and wherein the second computer is adapted to update the further conflict-resolution data in response to at least a further modification made to the replica linked value on the second computer;~~ and

at least one of the first computer and the second computer being further configured to resolve a replication conflict between a the linked value of the attribute in the object and the replica linked value of the attribute in the replica object, the replication conflict arising from the first modification made to the linked value on the first computer and from the further modification made to the replica linked value on the second computer, and the replication conflict being resolved, ~~with~~ at least in part, based upon the conflict-resolution data and the further conflict-resolution data ~~associated with the linked values.~~

The Applicant submits that Norris does not disclose at least “a multi-valued attribute that includes a value that links to a plurality of individual linked values”, as recited in claim 1 above. On at least this basis, the Applicant submits that

1 Norris does not support a § 102(a) rejection of claim 1, and requests  
2 reconsideration and withdrawal of the § 102(a) rejection of claim 1.

3 The Applicant has amended claims amend claims 2, 4, 6, 8, 10-11, and 13-  
4 14 depending from claim 1 for consistency with claim as revised above.

5 Claims 2-14 are allowable at least by virtue of their dependency upon claim  
6 1.

7 Turning to **independent claim 55**, the Applicant has revised claim 55 to  
8 clarify further features of the method. The revisions to claim 55 are believed fully  
9 supported under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, at least by Figures 4-6 and related  
10 discussion appearing from page 10, line 4 to page 13, line 14 of the Applicant's  
11 specification.

12 For convenience, claim 55 is reproduced here, with the above revisions  
13 shown in redline:

14 **55. (currently amended)** A method, comprising:

15 replicating an object stored in a first directory with a replica object stored in a second  
16 directory, the object and the replica object ~~each~~ having ~~an~~ a multi-valued attribute that includes a  
17 value that is a reference to link to ~~comprised of~~ multiple linked values, the multiple linked values  
18 ~~each~~ having respective conflict-resolution data associated therewith;

19 comparing an individual linked value of the attribute in the object with an individual  
20 linked value of the attribute in the replica object to identify a replication conflict; and

21 resolving the replication conflict with the conflict-resolution data associated with the  
22 individual linked values.

1 The Applicant submits that Norris fails to disclose at least “a multi-valued  
2 attribute that includes a value that is a reference to link to multiple linked values”,  
3 as recited in claim 55. On at least this basis, the Applicant submits that Norris  
4 does not support a § 102(a) rejection of claim 55, and requests reconsideration and  
5 withdrawal of the § 102(a) rejection of claim 55.

6 Claims 56-67 are allowable at least by virtue of their dependency upon  
7 claim 55.

8 Turning to **independent claim 73**, the Applicant has revised claim 73 to  
9 clarify further features of the method. The revisions to claim 73 are believed fully  
10 supported under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, at least by Figures 4-6 and related  
11 discussion appearing from page 10, line 4 to page 13, line 14 of the Applicant’s  
12 specification.

13 For convenience, claim 73 is reproduced here, with the above revisions  
14 shown in redline:

15  
16 73. (currently amended) A method for replicating at least one a-linked value of a  
17 plurality of linked values referenced by a value of a multi-valued attribute contained in an object,  
18 the linked value having conflict-resolution information associated therewith, and the object being  
19 replicated from-in a replica object having the multi-valued attribute and the value referencing the  
20 linked values, the replica object including a plurality of replica linked values having  
21 conflict-resolution information associated therewith the method comprising:

22 comparing the conflict-resolution information associated with the linked value as  
23 referenced by the value in the object with the conflict-resolution information associated with the  
24 linked value as referenced by the value in the replica object;  
25

1 identifying a replication conflict with the conflict-resolution information associated with  
2 the linked values; and

3 resolving the replication conflict with the conflict-resolution information.

4  
5 The Applicant submits that Norris fails to disclose at least:

6 “comparing the conflict-resolution information associated with the *linked value*  
7 *as referenced by the value in the object* with the conflict-resolution information  
8 associated with the *linked value as referenced by the value in the replica object*”,

9 as recited in claim 73. On at least this basis, the Applicant submits that Norris  
10 does not support a § 102(a) rejection of claim 73, and requests reconsideration and  
11 withdrawal of the § 102(a) rejection of claim 73.

12 Claims 74-80 are allowable at least by virtue of their dependency upon  
13 claim 73.

14 **35 U.S.C. §103 Claim Rejections**

15 Claims 18-24, 27-36, 39-40, 52-54, and 81-86 are rejected under  
16 35 U.S.C. §103(a) for obviousness over Norris in view of U.S. Patent No.  
17 6,865,576 to Gong, et al. (hereinafter, “Gong”) (*Office Action* p.15). The  
18 Applicant respectfully traverses these rejections.

19 Turning to **independent claim 18**, the Applicant has revised claim 18 to  
20 clarify further features of the state-based replication system. The revisions to  
21 claim 18 are believed fully supported under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, at least  
22 by Figures 4-6 and related discussion appearing from page 10, line 4 to page 13,  
23 line 14 of the Applicant’s specification.

1 For convenience, claim 18 is reproduced here, with the above revisions  
2 shown in redline:

3 **18. (currently amended)** A state-based replication system, comprising:

4 an object having a multi-valued attribute that includes a value which is a reference link to  
5 multiple referenced linked values, ~~each~~ at least one of the referenced linked values having  
6 associated therewith indicators to indicate a change to ~~a corresponding~~ the linked value of the  
7 attribute;

8 at least a further object replicating the object, the further object having a multi-valued  
9 attribute that includes a replica value which is a reference link to multiple referenced linked  
10 values, at least one of the referenced linked values having associated therewith indicators to  
11 indicate a change to the referenced linked value of the attribute; and

12 a computing device configured to replicate the object and to identify a change to a linked  
13 value of the attribute by a change to one or more of the indicators corresponding to the referenced  
14 linked values of the object or the further object.

15  
16 The Applicant agrees with the assessment at the bottom of page 15 of the  
17 Action that Norris does not explicitly teach a multi-valued attribute that includes a  
18 value which is a reference link to multiple linked values, as recited in claim 18.  
19 Thus, the Action cited Gong for this teaching. Gong pertains to an efficient  
20 schema for storing multi-value attributes in a directory service backing store.  
21 While Gong may reference “multi-value attributes”, the Applicant respectfully  
22 submits that it does not provide the teaching missing from Norris to properly  
23 support a § 103 rejection of claim 18.  
24  
25

1 Claim 18 recites, in part, with emphasis added to ease discussion:

2 “an object having a multi-valued attribute that includes a value which is a reference link  
3 to multiple referenced linked values, at least one of the *referenced linked values having*  
4 *associated therewith indicators* to indicate a change to the linked value of the attribute”.

5  
6 Norris and Gong, whether considered separately or in combination, fail to  
7 teach or suggest at least the “...referenced linked values having associated  
8 therewith indicators...”, as emphasized above. Because Norris neither teaches nor  
9 suggests a multi-valued attribute that includes a value which is a reference link to  
10 multiple referenced linked values, the Applicant submits that none of the various  
11 properties or values shown in Norris’ Figure 4-1 is a referenced linked value.  
12 Even assuming that Gong illustrates a multi-value attribute 66 in its Figure 5,  
13 neither Norris nor Gong provide any teaching or suggestion to associate the  
14 Applicant’s indicators with referenced linked values, as recited in claim 18. Any  
15 teaching or suggestion to do so comes only from the Applicant’s claims and  
16 specification.

17 On at least the foregoing basis, the Applicant submits that Norris and Gong  
18 do not support a § 103 rejection of claim 18, and the Applicant thus requests  
19 reconsideration and withdrawal of the § 103 rejection of claim 18.

20 Claim 19 is cancelled.

21 Claims 20-24 depend from claim 18, and the forgoing comments apply  
22 equally to these dependent claims.

23 Turning to **independent claim 27**, the Applicant has revised claim 27 to  
24 clarify further features of the state-based replication system. The revisions to  
25

1 claim 27 are believed fully supported under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, at least  
2 by Figures 4-6 and related discussion appearing from page 10, line 4 to page 13,  
3 line 14 of the Applicant's specification.

4 For convenience, claim 27 is reproduced here, with the above revisions  
5 shown in redline:

6  
7 **27. (currently amended)** A state-based replication system, comprising:

8 a first computer configured to maintain a first data structure, the first data structure  
9 having a multi-valued attribute that includes a reference link to multiple referenced linked values,  
10 ~~each the referenced~~ linked values having respective conflict-resolution information to indicate a  
11 change to a corresponding referenced linked value of the attribute;

12 a second computer configured to maintain a second data structure having the multi-  
13 valued attribute that includes the reference link to the multiple referenced linked values; and

14 the first and second data structures configured to be replicated and to have a replication  
15 conflict between a referenced linked value of the attribute in the first data structure and a  
16 referenced linked value of the attribute in the second data structure resolved with the conflict-  
17 resolution information associated with the referenced linked values.

18  
19 The revisions made to claim 27 are similar to those made to claim 18 as  
20 discussed above. Therefore, the comments directed above to claim 18 relative to  
21 Norris and Gong are largely applicable also to claim 27. The Applicant notes,  
22 however, that claim 18 recites "indicators", while claim 27 recites "conflict-  
23 resolution information". Nevertheless, the Applicant submits that Norris and  
24  
25

1 Gong neither teach nor suggest “referenced linked values having respective  
2 conflict-resolution information”, as recited in claim 27.

3 On at least the foregoing basis, the Applicant submits that Norris and Gong  
4 do not support a § 103 rejection of claim 27, and the Applicant thus requests  
5 reconsideration and withdrawal of the § 103 rejection of claim 27.

6 Claims 28-36 depend from claim 27, and the forgoing comments apply  
7 equally to these dependent claims.

8 Turning to **independent claim 39**, the Applicant has revised claim 39 to  
9 clarify further features of the computer-readable medium. The revisions to claim  
10 39 are believed fully supported under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, at least by  
11 Figures 4-6 and related discussion appearing from page 10, line 4 to page 13, line  
12 14 of the Applicant’s specification.

13 For convenience, claim 39 is reproduced here, with the above revisions  
14 shown in redline:

15  
16 **39. (previously presented)** A computer-readable medium having stored thereon a  
17 first data structure and a second data structure, comprising:

18 a first data field of the first data structure containing an attribute;

19 a second data field of the first data structure containing a value of the attribute contained  
20 in the first data field, the value being a reference link to multiple referenced linked values  
21 contained in the second data structure, the referenced linked values having respective conflict-  
22 resolution information;

23 a first data field of the second data structure containing a version indicator corresponding  
24 to a version of a referenced linked value contained in the second data structure; and  
25

1 a second data field of the second data structure containing an update indicator  
2 corresponding to when the version indicator contained in the first data field of the second data  
3 structure is changed.

4  
5 The revisions made to claim 39 are similar to those made to claim 18 as  
6 discussed above. Therefore, the comments directed above to claim 18 relative to  
7 Norris and Gong are largely applicable also to claim 39. The Applicant notes,  
8 however, that claim 18 recites “indicators”, while claim 39 recites a “version  
9 indicator” and an “update indicator”. Nevertheless, the Applicant submits that  
10 Norris and Gong neither teach nor suggest “referenced linked values having  
11 respective conflict-resolution information”, as recited in claim 39.

12 Also, regarding claim 39, page 23 of the Action did not indicate what  
13 aspects or portions of Figure 4-1 of Norris were applied to each of the particular  
14 features recited in claim 39 (e.g., the various recited “data fields”). If the rejection  
15 of claim 39 is maintained and based on Norris, the Applicant requests that the next  
16 Office Action provide more specificity as to how Norris was applied to claim 39.  
17 The same issue also affects other currently pending dependent claims that recite  
18 features similar to those recited in claim 39. For example, the rejection of claim  
19 36, bridging pages 22 and 23 of the Office Action, applies Figure 4-1 of Norris to  
20 the “creation indicator”, the “version indicator”, and the “update indicator” recited  
21 therein, but provides no further detail on what aspects of Figure 4-1 were applied  
22 to these various features.

1 On at least the foregoing basis, the Applicant submits that Norris and Gong  
2 do not support a § 103 rejection of claim 39, and the Applicant thus requests  
3 reconsideration and withdrawal of the § 103 rejection of claim 39.

4 Claim 40 depends from claim 39, and the forgoing comments apply equally  
5 to claim 40.

6 Turning to **independent claim 42**, the Applicant has revised claim 42 to  
7 clarify further features of the network system. The revisions to claim 42 are  
8 believed fully supported under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, at least by Figures  
9 4-6 and related discussion appearing from page 10, line 4 to page 13, line 14 of the  
10 Applicant's specification.

11 For convenience, claim 42 is reproduced here, with the above revisions  
12 shown in redline:

13  
14 **42. (currently amended)** A network system, comprising:

15 a first computer configured to replicate objects at an attribute level, and further  
16 configured to maintain an object having a multi-valued attribute that includes a value which is a  
17 reference link to multiple referenced linked values;

18 a second computer configured to replicate the objects at an attribute value level, and  
19 further configured to maintain a second object having the multi-valued attribute that includes the  
20 reference link to the multiple referenced linked values, ~~each~~ the referenced linked values  
21 configured to have respective conflict-resolution data;

22 the first computer further configured to:

23 replicate the second object from the second computer; and  
24  
25

1                    resolve a replication conflict between the object and the second object at the  
2                    attribute value level with the conflict-resolution data associated with a referenced linked  
3                    value.

4  
5                    The revisions made to claim 42 are similar to those made to claim 18 as  
6                    discussed above. Therefore, the comments directed above to claim 18 relative to  
7                    Norris and Gong are largely applicable also to claim 42. The Applicant notes,  
8                    however, that claim 18 recites “indicators”, while claim 42 recites “conflict-  
9                    resolution data”. Nevertheless, the Applicant submits that Norris and Gong  
10                    neither teach nor suggest “the referenced linked values configured to have  
11                    respective conflict-resolution data”, as recited in claim 42.

12                    On at least the foregoing basis, the Applicant submits that Norris and Gong  
13                    do not support a § 103 rejection of claim 42, and the Applicant thus requests  
14                    reconsideration and withdrawal of the § 103 rejection of claim 42.

15                    Claims 43-54 depend directly or indirectly from claim 42, and the forgoing  
16                    comments apply equally to claims 43-54.

17                    Turning to **independent claim 81**, the Applicant has revised claim 81 to  
18                    clarify further features of the method. The revisions to claim 81 are believed fully  
19                    supported under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, at least by Figures 4-6 and related  
20                    discussion appearing from page 10, line 4 to page 13, line 14 of the Applicant’s  
21                    specification.

22                    For convenience, claim 81 is reproduced here, with the above revisions  
23                    shown in redline:  
24  
25

1           **81. (currently amended)** A method, comprising:

2           replicating a first object with a second object, the first object having an attribute that  
3 includes a value which is a reference link to multiple referenced linked values, the second object  
4 having an attribute that includes a value which is the reference link to the multiple referenced  
5 linked values, ~~each~~ the referenced linked values configured to have associated conflict-resolution  
6 data;

7           resolving first a replication conflict between the first object and the second object at an  
8 attribute level; and

9           resolving second a replication conflict between the first object and the second object at an  
10 attribute value level with the conflict-resolution data associated with the multiple referenced  
11 linked values.

12  
13           The revisions made to claim 81 are similar to those made to claim 18 as  
14 discussed above. Therefore, the comments directed above to claim 18 relative to  
15 Norris and Gong are largely applicable also to claim 81. The Applicant notes,  
16 however, that claim 18 recites “indicators”, while claim 81 recites “conflict-  
17 resolution data”. Nevertheless, the Applicant submits that Norris and Gong  
18 neither teach nor suggest “the referenced linked values configured to have  
19 associated conflict-resolution data”, as recited in claim 81.

20           On at least the foregoing basis, the Applicant submits that Norris and Gong  
21 do not support a § 103 rejection of claim 81, and the Applicant thus requests  
22 reconsideration and withdrawal of the § 103 rejection of claim 81.

23           Claims 82-86 depend from claim 81, and the forgoing comments apply  
24 equally to claims 82-86.  
25

1 As stated on page 31 of the Action, claims 15-17 and 68-71 stand rejected  
2 under § 103 as being unpatentable over Norris in view of U.S. Patent No.  
3 6,295,541 to Bodnar, et al. (hereinafter, "Bodnar"). The Applicant respectfully  
4 traverses these rejections.

5 Claims 15-17 depend from claim 1, and thus all comments directed above  
6 to claim 1 apply equally to claims 15-17. In addition to those comments, however,  
7 the Applicant directs further comments to claim 15 in particular, as set forth  
8 below.

9 The Applicant reproduces claim 15 here for convenience, with emphasis  
10 added to ease discussion:

11  
12 **15. (previously presented)** A network system as recited in claim 1, wherein the  
13 individual linked values have an associated deletion indicator *that is a null identifier to indicate*  
14 *the existence of a linked value of the attribute in the object.*

15  
16 The Action cited column 39, line 45 to column 40, line 10 and Figure 10B  
17 Bodnar against claim 15 (Office Action, page 31). The cited portion of Bodnar  
18 references a logical delete flag 1016, which is discussed in detail at column 40,  
19 lines 1-5 of Bodnar. This portion of Bodnar is reproduced here for convenience as  
20 follows:

## 21 40

22 The logical delete flag **1016** is used to indicate that a GUD  
23 record is to be considered "deleted," as the result of a  
24 synchronization. The GUD record itself is not deleted, and  
25 thus the "deletion" is only a "logical deletion."

5 The nature and types of the other status information **1018**

1  
2 Bodnar's discussion of "logical deletion" is not sufficient to teach or  
3 suggest the subject matter emphasized in claim 15 above, and thus does not  
4 properly support a § 103 rejection of claim 15. On at least this additional basis,  
5 the Applicant requests reconsideration and withdrawal of the rejection of claim 15.

6 Claims 68-71 depend from claim 55, and thus all comments directed above  
7 to claim 55 apply equally to claims 68-71. In addition to those comments,  
8 however, the Applicant directs further comments to claim 68 in particular. Claim  
9 68 recites features similar to those recited in claim 15, which was discussed in the  
10 preceding paragraph. The comments directed to claim 15 thus apply equally to  
11 claim 68. On at least this additional basis, the Applicant requests reconsideration  
12 and withdrawal of the rejection of claim 68.

13 As stated on page 34 of the Action, claims 25-26, 37-38, and 41 stand  
14 rejected under § 103 as being unpatentable over Norris and Gong and further in  
15 view of Bodnar. The Applicant respectfully traverses these rejections.

16 Claims 25-26 depend from claim 18, and thus all comments directed above  
17 to claim 18 apply equally to claims 25-26. In addition to those comments,  
18 however, the Applicant directs further comments to claim 25.

19 Claim 25 recites features similar to those discussed above in connection  
20 with claims 15 and 68, and that discussion applies equally to claim 25. The  
21 Applicant thus agrees with the assessment on page 34 of the Action that Norris  
22 and Gong do not explicitly teach that "the indicators comprise a deletion indicator  
23 that has a null identifier to indicate the existence of a linked value of the attribute".  
24 However, at least for the reasons set forth above in the comments directed to  
25

1 claims 15 and 68, Bodnar fails to provide the teaching missing from Norris and  
2 Gong to properly support a § 103 rejection of claim 25. On at least this additional  
3 basis, the Applicant requests reconsideration and withdrawal of the rejection of  
4 claim 25.

5 Claims 37-38 depend from claim 27, and thus all comments directed above  
6 to claim 27 apply equally to claims 37-38. In addition to those comments,  
7 however, the Applicant directs further comments to claim 37 in particular.

8 Claim 37 recites features similar to those recited in claim 25, which was  
9 discussed in the preceding paragraph. On at least this same basis, Bodnar fails to  
10 provide the teaching missing from Norris and Gong to properly support a § 103  
11 rejection of claim 37. On at least this additional basis, the Applicant requests  
12 reconsideration and withdrawal of the rejection of claim 37.

13 Claim 41 depends from claim 39, and thus all comments directed above to  
14 claim 39 apply equally to claim 41.

15 **Conclusion**

16 The Applicant respectfully requests reconsideration and withdrawal of the  
17 rejections of claims 1-18 and 20-86. If any issues remain that preclude issuance of  
18 this application, the Examiner is urged to contact the undersigned attorney before  
19 issuing a subsequent Action.

20  
21 Respectfully Submitted,

22  
23 Dated: 18 AUG 05

24 By: 

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